

REMARKS

This Amendment is filed in response to the Office Action mailed July 12, 2007 and in connection with a Request for Continued Examination. The Applicant respectfully requests reconsideration of the pending rejections.

Claims 2-10, 12-16, 18 and 23-29 are pending in the case.

Claim 2, 10, 14, 18 and 23 were amended. Support for these amendments may be found in the Specification at page 5, line 28 to page 6 line 4 among other places in the specification.

Claims 27-29 were added.

Request for Interview

The Applicant respectfully requests a telephonic interview to advance the prosecution of this case. The Applicant believes an interview will be most productive after the Examiner has had an opportunity to review this Amendment, but prior to the issue of the next Office Action. As the Applicant can not determine when the Examiner will have time to consider this Amendment, given PTO workload, the Applicant respectfully requests the Examiner contact the Applicant at 617-951-2500 when he reviews this Amendment so that a time convenient to the Examiner may be arranged for a telephonic interview.

Claim Interpretation

At paragraph 14.1 the Office Action, the Examiner writes “[t]he Applicants have acquiesced through their silence that the statement that that link status is equivalent to pipe flow.” The Applicant respectfully urges that this is incorrect. The Applicant did not again argue this issue because the last Office Action indicated there was agreement that link status and pipe flow are **not** equivalent.

Specifically, previously in the Amendment dated Aug. 23, 2006, at page 10 under the heading “Response to Claim Interpretation,” the Applicant argued that link status and pipe flow are **not** equivalent.

In the Office Action mailed Dec. 26, 2006, at paragraph 6, the Examiner responded stating (emphasis added):

Response: Claim Interpretation

6. Applicants’ remarks regarding claim interpretation of pipe flow and link status have been reviewed and **found persuasive**.

Relying upon this indicated agreement, the Applicant moved on to discuss other issues in hopes of reaching a wider agreement. Accordingly, the Applicant respectfully requests reconsideration of the statements regarding Applicant’s acquiescence, with hopes that prosecution of the case may be advanced.

Claim Rejections – 35 U.S.C. §101

At paragraph 15 of the Office Action, Claims 2-10, 12-16, 18 and 23-26 were rejected under 35 U.S.C. §101. The Examiner further discusses the rejection at paragraphs 7-8 of the Office Action.

The Applicant respectfully urges that the amended claims are statutory as they provide a useful, tangible, and concrete result, namely “***providing the corresponding calibration solution.***” Such providing is useful as specific, substantial and credible utility is obtained by makings something available that was not available before. Such providing is tangible as a real-world result occurs, namely something is made available for use. Finally, the result is concrete as the result is substantially repeatable, i.e., the Applicant’s techniques may be repeated again to provide additional results. Accordingly, the applicant respectfully urges that the claims are statutory.

Claim Rejections – 35 U.S.C. §112, first paragraph

At paragraph 15 of the Office Action, Claims 2-10, 12-16, 18 appear to be rejected under 35 U.S.C. §112, first paragraph in connection with the enablement require-

ment. The Applicant respectfully urges that this rejection is partially a typographical error. Elsewhere, at paragraph 11 of the Office Action, the Examiner states (emphasis added):

Rejection of claim 3 is maintained.

11.2 The 35 U.S.C. §112 rejection of claims 2, 4-10, 12-16 and 18 have been withdrawn in view of the appropriate amendments and Remarks on page 10.

Accordingly, the Applicant assumes that only claim 3 is intended to still be rejected on these grounds.

In relation to claim 3, the Applicant respectfully requests reconsideration of the rejection. MPEP 2164.01 sets forth the test for enablement, directing that (emphasis added):

[t]he test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation."). ***A patent need not teach, and preferably omits, what is well known in the art.*** *In re Buchner*, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384, 231 USPQ 81, 94 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987); and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1463, 221 USPQ 481, 489 (Fed. Cir. 1984).

The Applicant's specification describes at page 9, lines 1-5:

As noted, the user may deliberately weight the observed data for focusing the calibration on critical data points. In order to do so, the user selects one of four weighting functions which can include, but are not limited to, linear, square, square root and logarithm to conduct the calibration on the weighted, observed hydraulic grade line (HGL) and/or pipe flows, as shown in steps 406 and 408. It may be determined that other weighting functions may also be used while remaining within the scope of the present invention.

The Applicant respectfully urges that upon reading in the specification that a weighting function is to be used, one of skill in the art would know how to implement such a function without undue experimentation. That is, one of skill in the art could draw upon their skill to implement such features after being given a direction to do so. Even if experimentation was required, it would not be undue. Accordingly, the Applicant respectfully requests reconsideration of the rejection.

Claim Rejections – 35 U.S.C. §102

At paragraph 18 of the Office Action, claims 2-5, 7-10, 12-16 and 23-26 were rejected under 35 U.S.C. §102(b), Walters et al., titled “Calibration of Water Distribution Network Models Using Genetic Algorithms” (hereinafter Walters).

The Applicant’s claim 2, representative in part of the other rejected independent claims, sets forth:

2. A method of automatically calibrating a water distribution model of a water distribution network, comprising the steps of:
 - (A) ***selecting calibration parameters including link status*** and one or more of, pipe roughness ***and junction demand***;
 - (B) collecting field observed data including a pipe flow measurement and a junction pressure measurement for at least one point in the water distribution network, and including corresponding loading conditions and boundary conditions that existed in the network when said field observed data was collected and passing such information to a genetic algorithm module;
 - (C) generating at said genetic algorithm module a population of calibration solutions that comprise a set of calibration results, using a genetic algorithm;
 - (D) running multiple hydraulic simulations of each solution to obtain a set of predictions of pipe flows and junction pressures at selected points in the network, corresponding to the loading conditions and associated boundary conditions when the field observed data was collected;
 - (E) performing a calibration evaluation including:
computing a goodness-of-fit value for each calibration solution based upon differences between field observed values and said predictions;

- (F) repeating steps (C) through (E) until a user-selected desired goodness-of-fit value is obtained resulting in a corresponding calibration solution for calibrating a water distribution model; and
- (G) providing the corresponding calibration solution to the hydraulic network simulation module to build a calibrated water distribution model.

Walters discusses a technique for calibrating a model by “adjusting pipe roughnesses until pressure and flow values predicted by the model are consistent with field measurement.” See page 132, 1st paragraph. “This is achieved by performing a large number of runs of the network model using trial values of pipe roughness, which are adjusted throughout the process using the principles of natural evolution,” in a genetic algorithm. See page 132, 2nd paragraph. Walters also mentions demands and pipe diameter may be used as variables, though discourages their use stating it is “not common practice.” See page 132, 4th paragraph and 133, 1st paragraph. Trials are performed using the variables and the results of the trials are pipe flow values. The resulting pipe flow values are compared with field measurements. See page 132, paragraph 1.

The Applicant respectfully urges that Walters does not teach or suggest the Applicant’s claimed “*selecting calibration parameters including link status.*”

While the Applicant claims using *link status* as a calibration parameter (a variable), varying *link status* along with one or more of, pipe roughness and junction demand, Walters does not suggest link status should be used as a variable. Rather, Walters focuses on varying pipe roughness and other factors to try to achieve an acceptable fit. This limits the quality of fit Walters may achieve. As the Applicant comments in the Background section of the Application

...known model calibration techniques use only one input parameter, pipe roughness...There remains a further need for a method which produces a more reliable model, and allows the user to employ a number of weighted parameters which more accurately reflect the particular network being modeled in order to customize that model so that it more closely represents the actual behavior of the network.

The Office Action points to a number of aspects of Walters as allegedly suggesting using link status as a calibration parameter. For example, the Office Action points to Walter's discussion of "pipe flow." First, the Applicant respectfully urges that agreement has been previously reached that link status and pipe flow are quite different and are not equivalent. Specifically, in the Amendment dated Aug. 23, 2006, the Applicant presented detailed discussion of how they are quite different. In response, in the Office Action mailed Dec. 26, 2006 at paragraph 6 the Examiner commented "Applicants' remarks regarding claim interpretation of pipe flow and link status have been reviewed and **found persuasive**" (emphasis added). The Applicant respectfully urges that such determination was correct, and hopes it may be the basis for further agreement.

Second, even if the Examiner no longer agrees with the Applicant regarding this issue, it is important to note that Walters does not suggest varying pipe flow as a calibration parameter. Rather, Walters measures pipe flow as a result (to be compared with real world data). This is made clear at Walters page 132, paragraph 1, which states "[m]odel calibration essentially comprises adjusting pipe roughness until pressure and flow values predicted by the model are consistent with field measurements." Walters never suggests pipe flow should be used as a calibration parameter. Thus, even if some disagreement regarding the meanings of link status and pipe flow remains, the Applicant's claims are still not suggested.

Further, the Applicant further respectfully directs the Examiner's attention to new dependent claim 28, which emphasizes the Applicant's use of link state, as well as new independent claim 29, which further illustrates novel differences from Walters.

Accordingly, for the above reasons, as well as the reasons discussed in the previous amendments, the Applicant respectfully urges that Walters is legally insufficient to anticipate the present claims under 35 U.S.C. §102.

Claim Rejections – 35 U.S.C. §103

At paragraph 19 of the Office Action, claims 6 and 18 were rejected under 35 U.S.C. §103(a) over Walters in view of Official Notice.

The Applicant respectfully urges that claim 6 is allowable due to its dependency from an allowable independent claim, as well as for other separate reasons.

Further, the Applicant respectfully urges that claim 18 includes limitations beyond what is suggested in Walters, or what is taken under Official Notice. Namely, claim 18 discusses “pausing a calibration run; determining intermediate values; observing the intermediate values by a user.” Walters makes no mention of this. Further, the Official Notice discusses saving data for moving a simulation between computers, and does not touch upon observing the intermediate values by a user. Thus, the Applicant respectfully urges that their combination does not render the Applicant’s claim obvious. The Applicant further urges that claim 18 is allowable due to its dependency from an allowable independent claim.


Conclusion

The Examiner is encouraged to call the undersigned attorney at (617) 951-2500.

In summary, all the independent claims are believed to be in condition for allowance and therefore all dependent claims that depend there from are believed to be in condition for allowance. The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,


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